

REMARKS

Claims 1-6 and 8-27 are pending in the application. Claim 1 has been amended. Claims 15-27 have been withdrawn from consideration.

DRAWINGS

The Examiner has objected to the drawings as failing to comply with 37 CFR §1.84(p)(4) because the reference character "108" has been used to designate both seal and cylinder, and the reference character "113" has been used to designate both seal and flexible membrane.

Applicants herewith submit a Replacement Sheet for Fig. 7, in which the cylinder member has been assigned reference character "118". In addition, the missing reference number "102" has been added for the second main part.

The specification has been amended to correctly identify the cylinder member as "118" on page 10, line 23. The specification at page 11, line 25 has been amended to correctly identify the membrane as "113". No new matter has been added with these amendments.

I. CLAIM REJECTIONS UNDER 35 U.S.C. §102(b)/§103

Claims 1-6, 8-9 and 12-14 have rejected under 35 U.S.C. §102(b) as being anticipated by Chou (U.S. Patent No. 6,482,742). Claim 10 has been rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Chou. Claim 11 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Chou et al. in view of Wolff (U.S. Patent No. 4,095,113).

Applicants respectfully traverse the rejections for at least the following reasons. Claim 1 has been amended to recite that *the membrane is devised to transfer said overpressure to said template or to said substrate and thereby to arrange said template and said substrate in parallel relation to one another by obtaining an even distribution of force over the whole of a contact surface between the substrate and the template.* Support for the amendment can be found in the specification at page 13, lines 13-24.

Chou does not provide an apparatus in which the template and the substrate are arranged in parallel relation to one another, since in Chou the force is not distributed evenly over the whole of the contact surface between the substrate and the template. Rather, in the apparatus shown in Figure 7 in Chou, not only will the jets push on the mold 10, but also the o-ring 78 will affect the mold 10.

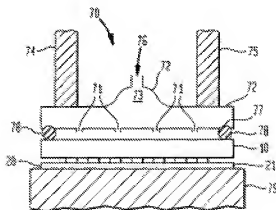


Fig. 7, Chou

As is disclosed in column 6, lines 4-9 of Chou, the o-ring 78 is intended to seal between the cap 72 and the mold 10. In order to achieve the sealing and thereby prevent the high pressure jets from escaping between the cap 72 and the mold 10, a pressure must be applied between the cap 72 and the o-ring 78 and between the o-ring and the mold 10, and this will of course affect the mold 10. Consequently, the o-ring will push on the mold 10 and expose the mold 10 to forces. Therefore it is very unlikely that the presence of the o-ring 78 makes the pressure more uniform as is stated in Chou in the same paragraph as recited above. On the contrary, it is believed that the distribution of the pressure on the mold 10 is more varying in the presence of the o-ring 78, since the pressure from the o-ring and from the jets not will be balanced. Thereby, the apparatus of Chou does not provide an even distribution of forces over the whole of the contact surface between the substrate and the template. The apparatus of Chou will not satisfy the high demand of even distribution that the inventors of the present invention have realized with the claimed apparatus.

In the presently claimed invention, an even distribution of force over the whole of the contact surface between the substrate and the template is obtained by the membrane 113 as is shown in Figure 9 of the present application. The membrane is a simple way to achieve an even distribution of forces. Consequently, the apparatus of Chou as shown in Figure 7 (above) does not provide an even distribution of forces and thereby is not devised to arrange the template and the substrate parallel in relation to one another. Chou does not provide an apparatus providing a uniform pressure in such a simple and thereby rather inexpensive manner as the present invention as defined in claim 1.

Nor would anything in Chou lead a person of ordinary skill in the art to modify the apparatus of Chou in order to achieve the present invention as defined in claim 1 having a membrane devised to arrange the template and the substrate in parallel relation to one another, since the presence of the o-ring 78 between the cap 72 and the mold 10 is said to make the pressure more uniform and thereby teaches away from the simple solution of the present invention according to claim 1.

Wolff is directed a tanning machine that produces UV radiation for the purpose of browning human skin. As such, Wolff does not cure the deficiencies of Chou. Even if one skilled in the art where somehow motivated to look to Wolff for a source of UV radiation in order to modify the lithographic apparatus of Chou, the resulting modified apparatus would not include all of the recited features of the apparatus of claim 11.

The presently claimed invention is neither anticipated by, nor obvious in view of Chou alone, or in combination with Wolff. Accordingly, the rejections under 35 U.S.C. §102(b)/103(a) should be withdrawn.

Claims 1-3, 5, 6, 8, 10 and 12 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kraakman et al. (U.S. Patent No. 4,312,823) in view of Heidari (U.S. Publication No. 2003/0159608). The Examiner states that Kraakman et al. teaches an apparatus for transferring a pattern from a template having a structured surface to a layer of a radiation polymerizable fluid. The Examiner

acknowledges that Kraakman et al. fails to teach that the substrate positioned on the first, top main part carries a surface layer of a radiation polymerizable fluid. It is the Examiner's position that an artisan armed with the teachings of both Kraakman et al. and Heidari would know that the device of Kraakman et al. would still function if the top and bottom parts were reversed, wherein the substrate would be positioned on the bottom so that the substrate would be configured to carry a surface layer of radiation polymerizable fluid.

Applicants respectfully traverse the rejection for at least the following reasons. As discussed above, claim 1 has been amended to recite that *the membrane is devised to transfer said overpressure to said template or to said substrate and thereby to arrange said template and said substrate in parallel relation to one another by obtaining an even distribution of force over the whole of a contact surface between the substrate and the template.*

Kraakman et al. is directed to a method of manufacturing a plastic record carrier. In the method of Kraakman et al., a relatively thick "blob" of molding resin is centrally placed on the molding surface. The flexible substrate is pressed down onto the resin to spread the resin over the surface of the mold. In carrying out the method of Kraakman et al., it is disclosed that the flexible substrate will be vaulted spherosymmetrically, that is, deformed into a convex shape bulging toward the mold (col. 1, lines 57-68; col. 5, lines 34-38 and Figure 2). Therefore, the force will not be distributed evenly. Instead the force will have a maximum in the center of the contact surface and decrease towards the periphery of the contact surface where it likely will be zero. Moreover, Kraakman et al. discloses that the flexible substrate becomes part of the plastic record carrier and is removed from the mold with the cured layer of molding resin (col. 3, lines 59-64). Thus, contrary to the Examiner's assertion, Kraakman et al. would not function if the bottom and top parts were reversed. In addition, Kraakman et al. does not teach a template and substrate in mutual parallel engagement with a flexible membrane that engages either the template or the substrate. Instead, the substrate of Kraakman et al. is the "transparent flexible membrane".

Heidari discloses an apparatus for nanoprint lithography wherein the substrate is heated by means of irradiation of the base plate and a support plate. Heidari fails to teach or suggest a radiation polymerizable fluid used as a surface layer on the substrate and a radiation source devised to emit radiation for solidifying the surface layer, the radiation emitted into the spacing between the first and second main parts.

One skilled in the art would not have been motivated to combine the teachings of Kraakman et al. with those of Heidari, because to do so would destroy the intended function of Kraakman et al. Kraakman et al. teaches that it is essential that the layer of resin be spread onto the mold surface by the convex, spherosymmetrically vaulted substrate in order to avoid or diminish internal stresses which result in deformation and possibly modulation of the stored information on the cured resin (col. 1, line 36 to col. 2, line 19). If one were to modify the apparatus of Kraakman et al. to arrange the mold surface (template) and substrate (11) in parallel relation to one another to obtain an even distribution of force over the whole of the contact surface between the substrate and the mold surface (template), the intended purpose of Kraakman et al. to avoid internal stresses would be destroyed. Because prima facie obviousness has not been established, the rejection of claims 1-3, 5, 6, 8, 10 and 12 under 35 U.S.C. §103(a) should be withdrawn.

Claims 1-4 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Heidari in view of Kraakman et al. The Examiner acknowledges that Heidari fails to teach a membrane that is transparent to a wavelength range of radiation. It is the Examiner's position that it would have been obvious to form the membrane out of a material transparent to a wavelength range of radiation based on the teaching of Kraakman et al., motivated by a desire to cure the medium with UV radiation.

Applicants respectfully traverse the rejection for at least the following reasons. As discussed above, claim 1 has been amended to recite that the *membrane is devised to transfer said overpressure to said template or to said substrate and thereby to arrange said template and said substrate in parallel relation to one another*

by obtaining an even distribution of force over the whole of a contact surface between the substrate and the template.

As discussed above, one skilled in the art would not have been motivated to combine the teachings of Kraakman et al. with those of Heidari, because to do so would destroy the intended function of Kraakman et al. Because prima facie obviousness has not been established, the rejection of claims 1-4 under 35 U.S.C. §103(a) should be withdrawn.

II. CONCLUSION

Accordingly, claims 1-6 and 8-14 are believed to be allowable and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should a petition for an extension of time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988.

Respectfully submitted,

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